

Saturday afternoon we started out by sleighs to the accompaniment of jingling bells. It was a merry sight. From the end of the road it was only a short walk to the sugar bush which was being operated by a group of Mohonk School boys as their spring project. Due to the late winter the season had just begun, but the temperature was high enough for the sap to be running and the "first run" was boiling in the great black kettle so we were able to experience the sights, sounds and smells that give such fascination to maple syrup making in the old-fashioned way.

From the sugar bush we walked and slid down through cedar dotted pastures. The sliding was in huge dishpans which had been brought along for the purpose. One's destination was unpredictable and the frequent upsets were highly amusing to the onlookers. Many animal tracks were noted—the skunk being most frequent. The prints of a very large buck were seen.

Supper was cooked by the leader at the old log cabin under the watchful eyes of many experts. Steaks, potatoes with onions and coffee disappeared in great quantities. The singing of old-time songs to the accompaniment of the accordion put us in the mood for the sleigh ride up the mountain. The stars were very brilliant and the northern lights put on a display for us, while nearby the kerosene lanterns cast weird shadows among the trees.

DANIEL SMILEY, JR.

PROCEEDINGS OF THE CLUB

THE ANNUAL MEETING, JANUARY 9, 1940

The Torrey Botanical Club held its annual meeting and dinner on January 9, 1940, at the Men's Faculty Club at Columbia University.

One hundred and five members and friends were present.

The following were elected to membership: *Annual*: Mr. Sanford S. Tepfer, 1354 East 19th St., Brooklyn, New York (transfer from Associate); and Dr. Herschell Fox, 237 East 20th Street, New York, N. Y. *Associate*: Miss Grace G. Lyman, 197 Main St., Easthampton, Mass. (transfer from Annual); Mr. Spencer Scott Marsh, Midwood Terrace, Madison, N. J. (transfer from Annual); Mrs. Spencer Scott Marsh, Midwood Terrace, Madison, N. J.;

and Miss Irene M. McLaughlin, 707 Gramatan Avenue, Mt. Vernon, N. Y.

The following resignations were accepted with regret: *Annual*: Mr. Henry Morrell, The Players, 16 Gramercy Park, New York, N. Y.; and Dr. R. Kent Beattie, 2032 Belmont Road, N. W., Washington, D. C.; *Associate*: Miss Helen Blanchard, 561 West 143rd Street, New York, N. Y.; and Miss Mary A. Clark, Bedford, N. Y.

Annual reports were given by all officers, delegates, and committee chairmen of the Club.

Attention was called to the fact that a new address book of taxonomists, geographers and ecologists is being prepared and that anyone who wishes his name to be included in this book should communicate with Dr. E. D. Merrill of Boston, Mass.

The result of the ballots for the election of officers for next year was read by the corresponding secretary whom the Club instructed to cast a final ballot for their election. The newly elected officers for 1940 are listed on the inside of the front cover.

Dr. B. O. Dodge on accepting the office of President of the Torrey Botanical Club stressed the importance of the members supporting the Club's publications not only financially but, what is more important, scientifically and that each member should take a personal interest and be loyal to the Club because it is his organization.

Dr. Graves in his retiring address spoke briefly of the Club's early history.

Dr. Karling proposed three objectives toward which the Club should strive during 1940:

1. A Torrey lecture known as the John Torrey address and that a fund known as the Torrey fund be started.

2. That there be greater and closer cooperation of the Torrey Club with the A. A. A. S. He suggested the possibility of a Torrey symposium held on one afternoon during the Christmas meetings of the A. A. A. S.

3. That the Torrey Club sponsor a Pan-American Botanical Congress.

It was further suggested that such addresses and papers of symposia be published in the *Bulletin* of the Club.

CLYDE CHANDLER
Recording Secretary

MEETING OF JANUARY 17, 1940

The meeting of the Torrey Botanical Club held at the New York Botanical Garden on January 17, was called to order by the president at 3.35 p.m.

Forty-eight persons were present.

The minutes of December 20, 1939 and January 9, 1940 were adopted as read.

It was moved by Dr. Karling and seconded by Dr. Zimmerman that the secretary cast a unanimous ballot for the election of the following members: *Annual*: Dr. Fred J. Seaver, New York Botanical Garden, Bronx Park, New York; Mr. Charles Gilly, New York Botanical Garden, Bronx Park, New York; and Mr. Arthur Davidoff, 725 West 172nd Street, New York. *Sustaining*: Dr. José Sáer d'Heguert, 98 Martin Tovar, Valencia, Venezuela.

The death of Prof. H. M. Jennison, Department of Botany, University of Tennessee, Knoxville, Tenn., was noted with regret.

The resignation of Mrs. Frederick Kavanagh as Bibliographer of the Club was accepted with regret. An unanimous ballot was cast for the election of Mrs. Lazella Schwarten to fill this vacancy.

As Dr. E. B. Matzke, an elected member to the Council, was elected second vice-president of the Club which automatically made him an ex-officio member of the Council, the Council nominated Dr. P. W. Zimmerman for election to fill the vacancy. Dr. Gleason moved and Dr. Karling seconded that the secretary be instructed to cast an unanimous ballot for the election of Dr. Zimmerman.

Dr. Karling announced that contributions to the Torrey Fund would now be accepted and that an artist at Columbia had volunteered to design the medal.

Mrs. Wanda K. Farr presented the results of her research on the "Formation of Cellulose Particles in Halicystis." The speaker's abstract follows:

"*Cellulose* and *starch* are compounds of carbon, hydrogen, and oxygen formed exclusively in the protoplasm of living plant cells. Although closely related to sugars and other carbohydrates of protoplasmic origin, they are classed also with those substances which, in the form of single crystallites or crystalline aggregates, are morphologically visible. Starch serves primarily as a food reserve; cellulose, as an important constituent of the framework of the plant.

Starch, in the form of grains of many shapes and sizes, is produced within a specialized organ of the protoplasm—a plastid. If the starch-forming plastids

contain chlorophyll or other pigments they are called chloroplasts or chromoplasts; if they are colorless, they are called leucoplasts. For almost a century microscopists have been able to observe the formation of starch in the plastids of living cells and have found it to be one of the most common and most conspicuous constituents of living protoplasm.

Cellulose has been more elusive and its microscopic identification in the living protoplast, long delayed. Until recently it was not known to exist as a crystalline entity in the living cell before it made its appearance in the cell wall. In 1934 cellulose crystallites in the form of barely visible, ellipsoid particles [(1.1 x 1.5 microns) or (0.00004 x 0.00006 inch)] were observed and identified in the protoplasm of many types of cells from various parts of the plant kingdom. Subsequent studies in which microscopic, chemical, and X-ray diffraction techniques have been used have confirmed and extended these observations.

The accumulated data have furnished no clew, however, to the place of origin of the cellulose particles in the living protoplast. Within recent months we have turned our efforts in this connection toward a more careful study of the protoplasmic constituents of some of the large single-celled, marine algae. The first observations which we have to report have been made upon the green alga, *Halicystis*, obtained from Bermuda through the courtesy of Doctor J. F. G. Wheeler of the *Bermuda Biological Station for Research*.

In the young, disc-shaped chloroplasts of these large cells there are two small, ring-shaped structures, usually placed so that an imaginary line passing through the central axis of each ring would lie approximately parallel to the major axis of the plastid disc. As the chloroplast enlarges there is a successive formation of new rings of larger diameter but equal thickness immediately inside the plastid membrane. These larger rings disintegrate within the plastid into uniform-sized particles. After the formation and particulate disintegration of two or more large rings, the chloroplast membrane itself breaks down, releasing into the outer regions of the cytoplasm, the entire plastid content. This material of plastid origin goes directly into the formation of the lamellae of the cell membrane. The two small rings disintegrate, each into four particles, either before the breakdown of the plastid membrane, after the breakdown of the plastid membrane, or after the deposition of the plastid material in the cell membrane. THESE UNIFORM-SIZED PARTICLES RESULTING FROM THE DISINTEGRATION OF THE RINGS FORMED WITHIN THE CHLOROPLAST WE HAVE IDENTIFIED AS MERCERIZED CELLULOSE BY BOTH MICROSCOPIC AND X-RAY DIFFRACTION ANALYSES.

"Mercerized" cellulose was first produced by John Mercer in 1844 through the treatment of the "native" cellulose of cotton fibers with solutions of strong sodium hydroxide. Cellulose particles mercerized by this method can be distinguished from native cellulose particles by their blue coloration in solutions of iodine (I₂KI) without previous treatment with strong acid, and by their characteristic X-ray diffraction pattern. Doctor van Iterson of Delft observed in 1936 that the cell membrane of *Halicystis* turns blue when treated with

iodine solutions and questioned, therefore, the cellulose nature of the crystalline membrane material which is clearly doubly-refractive in polarized light. Doctor Sisson of our department found in 1938 that the X-ray diffraction pattern of the cell membrane of *Halicystis* showed the presence of mercerized cellulose and the absence of native cellulose. This represented the first recorded observation of the presence of mercerized cellulose in an untreated plant cell membrane and explained the color reaction of the membrane in iodine solutions. There is, therefore, this limited but important background of accumulated facts with which to correlate our present data and assist in confirming our conclusion that **MERCERIZED CELLULOSE PARTICLES ARE FORMED IN THE LIVING CHLOROPLAST OF HALICYSTIS AND THAT THEY, WITH THEIR ASSOCIATED MATERIAL OF PLASTED ORIGIN, GO DIRECTLY INTO THE FORMATION OF THE LAMELLAE OF THE CELL MEMBRANE.**

The question at once arises as to whether or not the process of formation of cellulose particles within plastid-like structures in plant cells is restricted to mercerized particles in chlorophyll-containing plastids. These questions have been answered by a reinvestigation of the protoplasm of the developing cotton fiber. Our previous study of the young cotton fiber had dealt only with the identification of cellulose particles scattered separately in the cytoplasm and their behavior during fibril formation and subsequent deposition in the membrane. We now find in the cytoplasm, in corresponding stages of fiber development, structures which are circular in outline, variable in size, colorless, and so close in their refractive index to the cytoplasm itself that they are very nearly invisible. After removal of these structures from the fibers under carefully controlled osmotic conditions, their contents are more clearly visible. **THE FORMATION OF "NATIVE" CELLULOSE PARTICLES IN THE COLORLESS PLASTID-LIKE STRUCTURE OF THE COTTON FIBER BY A PROCESS OF RING-FORMATION SIMILAR TO THAT OF MERCERIZED PARTICLE FORMATION IN HALICYSTIS CAN THEN BE OBSERVED.**

The formation of mercerized cellulose particles in the chloroplast of *Halicystis* and of native cellulose particles in the colorless plastid of the cotton fiber takes place, therefore, by structural processes which are visible and essentially similar. In each instance the concentric rings of varying diameter but equal thickness make possible, through ring disintegration, the formation of cellulose particles of characteristic uniformity in size. This process of cellulose particle formation has no morphological similarity to the well-known appearance of starch grain formation in either chloroplasts or leucoplasts. Upon the basis of these observations **THE EXISTENCE OF CELLULOSE-FORMING PLASTIDS IS THEREFORE DEFINITELY ESTABLISHED.**

The knowledge that fully formed cellulose particles are discharged into the cytoplasm by the rupture of the membrane of the plastid in which they have been formed serves to clear away the mystery of the sudden appearance of crystalline cellulose particles in living cells. The fact that cellulose particles can be formed in either a chloroplast or a colorless plastid, and in either the

mercerized or native state is, however, the consideration of paramount importance and its recognition will enable us to attack, with renewed hope, the solution of the many difficult problems concerned with the synthesis of carbohydrates in the living cell."

CLYDE CHANDLER
Recording Secretary

MEETING OF FEBRUARY 6, 1940

The meeting of the Torrey Botanical Club held at the American Museum of Natural History February 6, was called to order by the President at 8.15 p.m.

Seventy-six persons were present.

The minutes of the meeting of January 17 were adopted as read.

It was moved by Dr. E. W. Sinnott and approved by the Club that the secretary cast an unanimous ballot for the election of the following to membership in the Torrey Club.

Annual: Mr. Robert E. Duncan, 41 Coburn Hall, University of Maine, Orono, Me.; Mr. Edwin De T. Bechtel, 2 Wall Street, New York; Mrs. Donald Durant, 419 East 57th Street, New York; Mr. O. G. Fitzgerald, Room 844, 641 Washington Street, New York; Mrs. Richard Fondiller, 119 West 71st Street, New York; Mr. George Thomas Johnson, Dept. of Botany, Washington University, St. Louis, Mo.; and Mr. Rogers McVaugh, 2044 Pierce Mill Road, N. W., Washington, D. C.

Transfer from associate to annual: Prof. J. E. Weaver, University of Nebraska, Station A., Lincoln, Neb., and Mrs. Lazella Schwarten, New York Botanical Garden, Bronx Park, New York.

Associate: Mrs. Regina Jais, 1016 Fifth Avenue, New York; Mr. D. Yardeni, 14 Mount Hope Place, Bronx, New York; Mrs. Vance R. Hood (Elizabeth Hood), 456 Rockaway Avenue, Boonton, N. J., and Mr. Robert L. Fowler, Department of Botany, University of Nebraska, Lincoln, Neb.

Professor Harold St. John presented an interesting and well illustrated lecture on "The Jungles of Fiji."

CLYDE CHANDLER
Recording Secretary

MEETING OF FEBRUARY 21, 1940

The meeting of the Torrey Botanical Club held at the New York Botanical Garden on Wednesday, February 21, was called to order by the President at 3.30 p.m.

Thirty-four persons were present.

The minutes of February 6 were adopted as read.

Thirty-two people were elected to annual membership: Prof. Themistocles F. Acconci, Manhattan College, New York; Prof. Irving W. Bailey, Biological Laboratories, Harvard University, Cambridge, Mass.; Dr. Tibor Benedek, 25 East Washington Street, Chicago, Ill.; Dr. Anton H. Berkman, College of Mines, El Paso, Texas; Dr. Hugo L. Blomquist, Dept. of Bot., Duke Univ., Durham, N. C.; Dr. Vernon I. Cheadle, Botany Dept., Rhode Island State College, Kingston, R. I.; Dr. Alfred E. Clarke, 8318 16th St., Silver Spring, Md.; Mr. Arthur LeRoy Cohen, Biological Laboratories, Harvard University, Cambridge, Mass.; Mr. George H. Conant, Ripon, Wis.; Dr. Henry S. Conard, Grinnell College, Grinnell, Iowa; Dr. Lester Peter Coonen, De Sales College, Toledo, Ohio; Dr. Gertrude Elizabeth Douglas, 205 Lancaster Street, Albany, N. Y.; Mrs. Frederic W. Goddard [Gladys B.], 747 Dixie Lane, Plainfield, N. J.; Dr. Sam Granick, Rockefeller Institute for Medical Research, 66th Street and York Ave., New York; Dr. Charlotte L. Grant, 3302 Grace Land Ave., Indianapolis, Ind.; Dr. J. M. Greenman, Missouri Botanical Garden, St. Louis, Mo.; Mrs. R. M. Gunnison, 47 Brewster Road, Scarsdale, N. Y.; Dr. Stuart K. Harris, 33 Lebanon St., Winchester, Mass.; Dr. Gail Hamilton Holliday, 85 31st St., Wheeling, W. Va.; Miss Olivia Erdmann Kuser, Titusville, N. J.; Dr. W. E. Loomis, Dept. of Bot., Iowa State College, Ames, Iowa; Dr. Gaspar A. Loughridge, 122 Farm St., Ithaca, N. Y.; Dr. H. J. Lutz, Yale School of Forestry, New Haven, Conn.; Mr. H. H. McKinney, Virus Laboratory, U. S. Bureau of Plant Industry, Arlington Farm, Arlington, Va.; Dr. Morris Moore, The Barnard Free Skin and Cancer Hospital, 3427 Washington Boulevard, St. Louis, Mo.; Mr. Robert L. Piemeisel, Box 826, Twin Falls, Idaho; Dr. Herbert Parkes Riley, Department of Botany, University of Washington, Seattle, Wash.; Dr. Neil E. Stevens, Dept. of Bot., University of Illinois, Urbana, Ill.; Mr. George Lincoln Teller, 31 North State St., Chicago, Ill.; Dr. Joseph Aaron Trent, State Teachers College, Pittsburg, Kan.; Mr. Maurice Burke Walters, 14556 Superior Road, Cleveland Heights, Ohio; and Dr. Coaracy M. Franco, Instituto Agronomico do Estado, Campinas, Sao Paulo, Brazil.

Mr. Charles F. Doney, Brooklyn Botanic Garden, 1000 Washington Avenue, Brooklyn, N. Y., was elected to associate membership.

Dr. Archer M. Huntington, 1 East 89th Street, New York, was elected to life membership in the Club.

The resignation of Miss Wellmer Pessels, 47 West 55th Street, New York, was noted with regret.

The auditing committee, composed of Mr. Henry de la Montagne and Dr. A. B. Stout, who called to their assistance Mr. E. J. Countey, made the following report: Treasurer's books examined and found correct, January 30, 1940. Certain recommendations made by the Committee are in the hands of the President of the Club.

The President made the following announcements:

(1) On March 6th at 4 p.m. Mr. Rutherford Platt will show colored pictures of autumn woods. This show will be held in the McMillan Theater at Columbia University.

(2) Dr. Harold N. Moldenke will receive contributions to a fund to be used toward the purchase of a piece of land, Anthony's Nose, for a memorial to the late Raymond H. Torrey.

(3) At the next meeting of the Club Dr. Harold N. Moldenke will speak on: "A Naturalist in Florida."

The scientific program consisted of a talk on The Relation Between the Sporophyte and Gametophyte in the Bryophytes, by Dr. Harold C. Bold of Barnard College.

The speaker's abstract follows:

"Current accounts of the Morphology of the Bryophyta are in error in minimizing the occurrence and importance of photosynthesis in the nutrition of the sporophyte. It is apparently universal and begins at an early stage continuing throughout the ontogeny of the sporophyte. Although this was known over a hundred years ago its significance was not understood. It has apparently been forgotten or overlooked because most modern studies are based on the analysis of fixed and stained material. The Bryophyte sporophyte is therefore largely "independent" of its gametophyte for carbohydrate nutrition and is more properly described as "epiphytic" rather than as "parasitic." The theories of antithetic alternation and progressive sterilization as applied to the Bryophyta have been important factors in delaying recognition of the occurrence of photosynthesis in the sporophytes of these plants. The homologous theory of alternation of generations receives support from and is in accord with these observations."

The meeting adjourned at 4.30 p.m. after which tea was served by the New York Botanical Garden.

CLYDE CHANDLER
Recording Secretary

MEETING OF MARCH 5, 1940

The meeting of the Torrey Botanical Club held at the American Museum of Natural History on March 5, was called to order by the President at 8.15 p.m.

Forty-eight persons were present.

The minutes of the meeting of February 21 were adopted as read.

Seventeen persons were elected to Annual Membership: Dr. James Bonner, California Institute of Technology, Pasadena, Calif.; Dr. Hettie M. Chute, 70 Townsend Street, New Brunswick, N. J.; Miss Ruth Curtis, 613 South Braddock Avenue, Pittsburgh, Penn.; Mr. Delzie Demaree, Arkansas A. & M. College, Monticello, Ark.; Dr. G. W. Goldsmith, Box 1611, University Station, Austin, Texas; Mr. Robert L. Hulbary, Dept. of Botany, Columbia University, New York; Rev. George M. Link, Grafton, Ill.; Dr. Blanche McAvoy, 108 West Ash Street, Normal, Ill.; Mr. Charles B. Reif, 319 West 50th Street, Minneapolis, Minn.; Dr. George Dewey Ruehle, Subtropical Experiment Station, Homestead, Fla.; Dr. William Seifrizz, Dept. of Botany, University of Pennsylvania, Philadelphia, Penn.; Dr. Forrest Shreve, Box 471, Tucson, Ariz.; Dr. G. Ledyard Stebbins, Jr., 314 Hilgard Hall, University of California, Berkeley, Calif.; Dr. H. E. Warmke, Dept. of Genetics, Carnegie Institution, Cold Spring Harbor, N. Y.; Mr. Henry F. Westheimer, R. F. D. No. 1, Springdale, Conn.; Dr. Roy M. Whelden, New Durham, N. H., and Mrs. Martha S. Wood [Mrs. L. Hollingsworth Wood], "Braewold," Mount Kisco, N. Y.

Three persons were elected to Associate Membership: Miss Helen M. Fraser, 51 South Maple Avenue, Ridgewood, N. J.; Mrs. Richard M. Lawton, 1215 Prospect Avenue, Plainfield, N. J., and Dr. M. D. Mann, Jr., 625 Locust Street, Roselle, N. J.

The resignation of Mrs. Howard S. Kaltenborn, R. F. D. No. 2, Ruston, Louisiana, was noted with regret.

Dr. W. S. Thomas, who was appointed to represent the Torrey Club at the New York-New Jersey Trail Conference, reported that

the southern gateway to the Hudson Highlands will be saved from further destruction and that the required funds for the purchase of the land known as Anthony's Nose are available.

Dr. Harold N. Moldenke of the New York Botanical Garden staff, delivered the popular lecture of the evening. The speaker's abstract of "A Naturalist in Florida" follows:

"In the southeastern United States there are some 5600 species of wild flowering plants, or one-third more than there are in the northeastern states (where there are only 3800). Of the total number in the Southeast, Florida has over 3600, or 65 percent, including 130 ferns and fern-allies, 81 orchids, and 50 epiphytes. It is a land of many waters—90 rivers, 110 large creeks, 200 lakes, 3,000,000 acres of everglades, and a coast line of 1,172 miles. Its largest lake, Lake Okeechobee, is the second largest fresh-water lake entirely within the U. S. A. Aquatic and marsh birds naturally abound, with 22 species of long-legged wading birds, including herons, ibis, egrets, storks, and bitterns in abundance. Endemic plant and animal species and varieties are numbered in the hundreds. A relative of the cultivated Boston fern is found in the rich hammocks with fronds seventeen to twenty-eight feet in length and an orchid with inflorescences seven to eight feet long, bearing up to a hundred flowers. Curious stream-lined water-turkeys swim under water with sufficient speed to overtake fish, and 3 species of scavenger birds vie with each other in disposing of dead animal remains. Among the distinctive ecological formations, each with its distinct varieties of plants and animals, are the coastal dunes, the pinelands, the hammocks, the everglades, the prairies, the costal mangrove lagoons, and the cypress-heads. Sloughs often protect the rich hammocks from the devastating everglade fires. Streams are often completely obscured by masses of floating water-hyacinths or water-lettuce. Wild-cats and panthers inhabit the more remote hammocks, alligators may still be found, and among the serpents are the water-moccasin, diamond-back and pygmy rattlesnakes, gopher-snake, and coral snake. Discovered first by Escalante de Fontanada in 1530, the everglades were called the Laguna del Espirito Santo, and the islands in them (everglade keys) the Cayos del Espirito Santo. In the winter the everglades may be dry, except for the natural streams and artificial canals which run through them, or covered with only a foot or two of water, but in the summer they are flooded, chiefly from underground streams which break up through the thin overlying rock strata in thousands of places, to a depth of ten or twelve feet. The region is unique and fascinating, a veritable treasure-house for the naturalist, and one which should by all means be preserved intact for posterity. It is urged that all friends of the great out-of-doors unite with naturalists and conservationists in backing the proposed Everglades National Park and in insuring its permanent maintenance."

The meeting adjourned at 9.45 p.m.

CLYDE CHANDLER
Recording Secretary

ADDITIONAL FIELD TRIP FOR THE CLUB

By invitation of John Scheepers, Inc., members of the Torrey Botanical Club are invited to visit the display and experimental gardens at the Scheepers' Estate, "Paradou," on Saturday, June 15, when Irises and Peonies will be the feature display. There will be a conducted tour with a talk by the Holland Hostess and a visit to the garden mart. Assemble at "Paradou" at 1.30 p.m.

Paradou is at Brookville, Long Island. Take N.Y. Route 25A, Northern Boulevard.

Corrections: In the March-April number, on page 58, in the report of the scientific program the name of Dr. R. Bloch was misspelled.

On page 59, paragraph 3, line 7, casual should read causal.

In the same number in the article on Pronouncing Lichen Names on page 41, *gracilis* and *gracilescens* should be printed phonetically (gräs'i-lis) and (gräs-i-le'sens), not with the long ä, also saepincola and caespiticia are misspelled.

NEWS NOTES

Poisonous Plants. A pretentious project is under way with chemists, pharmacologists, toxicologists, medical men and botanists in many institutions and countries cooperating, in which all plants reported to be poisonous to men or animals are to be studied. Dr. Harold Moldenke of the New York Botanical Garden is covering the northeastern United States. Members of the Club can cooperate by collecting plants supposed to be poisonous. The collections should include a good specimen in flower properly pressed with data as to time and place collected, also about one pound of the plant material sun dried. Care to be taken that the drying material does not mould and that no impurities are included.

Gray Herbarium. In the annual report of the herbarium by Dr. M. L. Fernald it is stated that more than 39,000 mounted specimens were added to the herbarium in 1939, bringing the collection of flowering plants and ferns to 1,033,850 sheets.